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Jurgen Osterlanger

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EXAMINER

WAITS, ALAN B

ART UNIT

PAPER NUMBER

3656

NOTIFICATION DATE

DELIVERY MODE

08/10/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

info@lmiplaw.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/538,908	<b>Applicant(s)</b> OSTERLANGER, JURGEN	
	<b>Examiner</b> ALAN B. WAITS	<b>Art Unit</b> 3656	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 June 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 January 2008 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Request for Continued Examination***

1. The request filed on June 11, 2009 for a Continued Examination (RCE) is accepted and a continued prosecution application has been established. An action on the RCE follows.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “hollow rotor mounted rotatably and secured within a hub” must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

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the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claim limitation “rolling mounting means for rotatably mounting the rolling-body screw mechanism in the housing” uses the phrase “means for” or “step for”, but it is modified by some structure, material, or acts recited in the claim. It is unclear whether the recited structure, material, or acts are sufficient for performing the claimed function which would preclude application of 35 U.S.C. 112, sixth paragraph, because the next limitation defines the rolling mounting means using structure.

If applicant wishes to have the claim limitation treated under 35 U.S.C. 112, sixth paragraph, applicant is required to amend the claim so that the phrase “means for” or “step for” is clearly **not** modified by sufficient structure, material, or acts for performing the claimed function.

If applicant does **not** wish to have the claim limitation treated under 35 U.S.C. 112, sixth paragraph, applicant is required to amend the claim so that it will clearly not be a means (or step) plus function limitation (e.g., deleting the phrase “means for” or “step for”).

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Claim 1 and 9 recite the limitation “a hollow rotor mounted rotatably and secured within a hub”. It is unclear how the rotor (which lies on the outside of the ball nut) can be within the hub.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1, 4, 5, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tatewaki et al US 2002/0148672 in view of Saruwatari et al US 2002/0096389.

Tatewaki discloses a similar device comprising:

Re clm 1:

- A rolling-body screw mechanism (B, fig 5) having an axis of rotation
- A housing divided into two housing parts (233 and 231, respectively, fig 5) transversely to the axis of rotation
- A hollow rotor (102, fig 2) mounted rotatably and secured within a hub (inner portion of rotor 102 that meets the ball nut, fig 2) mounted on a spindle nut (103, fig 2)
- A threaded spindle (101b, fig 2)
- The spindle nut being drive-connected to the rotor (103 is connected to 102, fig 2)

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- A rolling mounting means (113, fig 2) provided on only one housing part (233, fig 5) of the housing
- The rolling mounting means is formed by a multi-row angular ball bearing ([0080], last sentence)
- An outer ring (outside of 113, fig 2) seated in a housing bore (slot that 113 fits into 233, fig 5) of the one housing part
- The mounting means is positioned with respect to the spindle nut to carry the spindle nut, the hub and the hollow rotor in a cantilevered manner (fig 2)

Although Tatewaki does indeed disclose:

- Ball grooves (groove on inner ring where ball 108 sits, fig 2) of the angular ball bearing (113, fig 2) are formed on an outer circumference of the spindle nut (103, fig 2)

he does not disclose:

- Ball grooves (groove on inner ring where ball 108 sits, fig 2) of the angular ball bearing (113, fig 2) being formed directly on an outer circumference of the spindle nut (103, fig 2)

Saruwatari teaches:

- Ball grooves (of bearing 14, fig 2) of the ball bearing (14, fig 2) being formed directly on an outer circumference of the spindle nut (5, fig 2)

for the purpose of reducing the number of parts required for assembly and thus reducing the cost of the device.

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It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Tatewaki and provide:

- Ball grooves of the angular ball bearing being formed directly on an outer circumference of the spindle nut

for the purpose of reducing the number of parts required for assembly and thus reducing the cost of the device.

Tatewaki further discloses:

Re clm 4:

- The rolling mounting means is arranged axially within a construction space occupied by the spindle nut (rolling mounting means 113 is in the same construction space as nut 103, fig 2)

Re clm 5:

- The rotor (102, fig 2) is arranged axially within a construction space (region that the nut occupies, fig 2) occupied by the spindle nut (103, fig 2)

Re clm 9, Tatewaki discloses a similar device comprising:

- A rolling-body screw mechanism (B, fig 5) having an axis of rotation
- A housing divided into two housing parts (233 and 231, respectively, fig 5) transversely to the axis of rotation
- A hollow rotor (102, fig 2) mounted rotatably and secured within a hub (inner portion of rotor 102 that meets ball nut 103, fig 2) on a threaded spindle nut (103, fig 2)
- A threaded spindle (101b, fig 2)

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- The spindle nut being drive-connected to the rotor by means of the hub (103 is connected to 102, fig 2) at a position axially displaced from the threads of the spindle nut (102 is connected at a place where the nut has not threads, fig 2)
- A rolling mounting means (113, fig 2) provided on only one housing part (233, fig 5) of the housing
- The rolling mounting means is formed by a multi-row angular ball bearing ([0080], last sentence)
- An outer ring (outside of 113, fig 2) seated in a housing bore (slot that 113 fits into 233, fig 5) of the one housing part
- The mounting means is positioned with respect to the spindle nut to receive all of the loading there from in a cantilevered manner (fig 2)

Although Tatewaki does indeed disclose:

- Ball grooves (groove on inner ring where ball 108 sits, fig 2) of the angular ball bearing (113, fig 2) are formed on an outer circumference of the spindle nut (103, fig 2)

he does not disclose:

- Ball grooves (groove on inner ring where ball 108 sits, fig 2) of the angular ball bearing (113, fig 2) being formed directly on an outer circumference of the spindle nut (103, fig 2)

Saruwatari teaches:



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- Ball grooves (of bearing 14, fig 2) of the ball bearing (14, fig 2) being formed directly on an outer circumference of the spindle nut (5, fig 2)

for the purpose of reducing the number of parts required for assembly and thus reducing the cost of the device.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Tatewaki and provide:

- Ball grooves of the angular ball bearing being formed directly on an outer circumference of the spindle nut

for the purpose of reducing the number of parts required for assembly and thus reducing the cost of the device.

7. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tatewaki et al US 2002/0148672 in view of Saruwatari et al US 2002/0096389 as applied to claims 1 and 4 above, and further in view of R. E. Osborne USP 2964967.

Tatewaki in view of Saruwatari discloses all the claimed subject matter as described above.

Re clm 6 and 7:

Although Tatewaki discloses the rolling-body screw mechanism is a ball screw mechanism (103, fig 2) with a deflection ([0081]) for balls of the ball screw mechanism

He does not explicitly disclose the rolling-body screw mechanism is a ball screw mechanism with an outer deflection for balls of the ball screw mechanism.

Osborne teaches the rolling-body screw mechanism (16, fig 1) is a ball screw mechanism with an outer deflection (20, fig 1) for balls (22, fig 1) of the ball screw

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mechanism for the purpose of providing for an improved means for circulating the balls in the ball nut.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Tatewaki and provide the rolling-body screw mechanism is a ball screw mechanism with an outer deflection for balls of the ball screw mechanism, as taught by Osborne, for the purpose of providing for an improved means for circulating the balls in the ball nut.

Tatewaki in view of Osborne further disclose:

Re clm 7:

- The spindle nut (103, fig 2; Tatewaki) is provided, in a region radially between the threaded spindle (101b, fig 2; Tatewaki) and the rolling mounting means (113, fig 2; Tatewaki)
- A return bore (the way tube 20 connects to grooves 18, fig 1; Osborne) for balls of the ball screw mechanism

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tatewaki et al US 2002/0148672 in view of Saruwatari et al US 2002/0096389 as applied to claim 1 above, and further in view of Bugosh US 2003/0192734.

Tatewaki discloses all the claimed subject matter as described above.

Tatewaki does not disclose:

- The rotor (102, fig 2) being provided with a driving surface for drive belts

Bugosh teaches:

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- The rotor (82, fig 2) being provided with a driving surface (outside of 82, fig 2) for drive belts (164, fig 2)

for the purpose of providing an improved means of driving the rotor.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Tatewaki have the rotor being provided with a driving surface for the drive belts on the circumference of the rotor for the purpose of providing an improved means of driving the rotor.

### ***Response to Arguments***

9. Applicant's arguments filed June 11, 2009 have been fully considered but they are not persuasive.

Applicant argues that the rotor of the present invention is mounted within a hub. The examiner respectfully disagrees and points to the 112, second paragraph, rejection and the drawing objection above. The hub is shown in fig 1 of applicants disclosure as element 9. The rotor is shown as element 6. In no way is the rotor mounted within the hub.

Applicant also argues that:

"the location of the angular contact ball bearing, outer ring and balls of the present invention are positioned within the housing of the drive device at the end in close proximity to the ball screw mechanism and the spindle nut has ball grooves that act as an inner ring for the bearing."

The examiner believes that the 103 rejection above clearly meets every limitation of the claims as recited. Furthermore, Applicant is arguing limitations not found in the claims. The examiner notes that "close proximity" is a term of degree, and, if it were recited in the claims, are sufficiently broad to incorporate the prior art.

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Applicant further argues that:

“Thus, the load generated along the spindle is not transferred to the bearing in a cantilevered arrangement or where the bearing would be axially displaced from the load in either Tatewaki or Saruwatari.”

The examiner respectfully disagrees. The only way the ball nut and rotor are supported relative to the housing in the Tatewaki reference is by the bearing. This is the only way forces from the ball nut can be transferred to the housing.

Applicant further argues:

“Significant structural modifications to Saruwatari would be required for ball grooves of the angular ball bearing to be directly on the outer circumference of the spindle nut and for the electric power steering apparatus of Saruwatari still function in its intended manner. The modifications would require extensive redesign to the overall structure of the electric power steering apparatus as all components of Saruwatari are fixed in a compact manner which depends upon the position of mating components. At a minimum, the hub and outer ring would have to be redesigned to ensure the balls of the bearing are still in secure contact with the outer ring and now spindle nut. Removing the inner race which currently is fixed between the balls and spindle nut would create a gap that would be too great For the bearing to work efficiently without extensive redesign to the overall component. Retooling machinery or potentially remolding castings, in the case of the hub, would be an extremely time consuming and expensive process.”

In response to applicant's arguments above, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALAN B. WAITS whose telephone number is (571)270-3664. The examiner can normally be reached on Monday through Friday 7:30 am to 5 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Ridley can be reached on 571-272-6917. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alan B Waits/  
Examiner, Art Unit 3656

/Richard WL Ridley/  
Supervisory Patent Examiner, Art Unit 3656